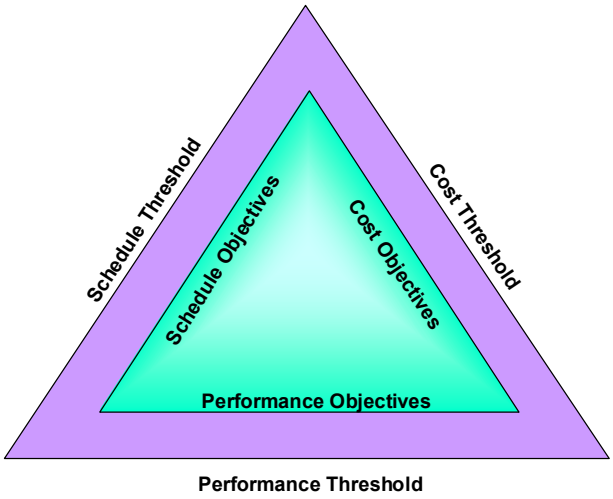
8 ACQUISITION PERFORMANCE BASELINE

The APB is one of the most essential elements in the acquisition process. The APB is the Department's means of obtaining corporate performance commitments and approval for a project from the entire acquisition organization, OMBE, and Congress. The APB identifies the performance requirements, schedule requirements, and cost requirements (TPC) for a project. All acquisition projects will establish an APB that is approved by the AE as a part of CD-2.

The APB is defined by objectives and minimum threshold values that are converted into key parameters. The objectives values are established for performance, schedule, and cost, and represent the desired mission objectives. The threshold values are more conservative objectives for performance, schedule, and cost that represent the APB boundaries, and are the essence of the commitment to Congress. These key parameters define the necessary elements of an APB in terms of performance, schedule, and cost. Key parameters are those that, if the thresholds cannot be met, the AE would require a reevaluation of the concepts, design approaches, and acquisition strategy for an acquisition. The APB key parameters should represent the project as it is expected to be completed. The total number of key parameters should be the minimum number needed to characterize the three major acquisition drivers: performance, schedule, and cost. These parameters, once defined and approved, become the KPPs. A project's APB should include sufficient key performance, schedule, and cost parameters to clearly establish the capabilities being acquired, the schedule for the acquisition, and the total cost to acquire that capability. Figure 8-1



depicts these relationships.

Figure 8-1. The APB Elements

The distinction between KPPs and other technical and scope parameters is that KPPs are objectives, or what the system is expected to do and define what capability will exist at the end of the project. KPPs represent the operational capability required to perform a specific mission and are therefore stated in terms of performing a function instead of a design parameter or specification. **Key Performance Parameters (KPP) shall be identified which reflect the minimum and/or maximum acceptable performance for the acquired capability at completion.** The desired transition to operations is to be defined in the APB as the IOC. The attainment of IOC is one of the key deliverables for completing CD-4 and ensures that projects can proceed to closeout efficiently.

The project, in coordination with the IPT, can trade-off performance, schedule and cost within the range between the objective values and the threshold values without obtaining approval of the AE. However, the project is to comply with the change control process as defined in the project PEP.

8.1 Acquisition Performance Baseline Content

All projects are defined by three primary elements: the performance capabilities necessary to meet a mission need, a timeframe within which the capability is required, and the total cost for providing the capability. These elements are integrated to create the framework within which project execution takes place. The parameters that represent the elements of the APB evolve and develop over time, and are formally established when the APB is approved at CD-2. The inputs to the process to define the APB include the MNS, functions, operating requirements, constraints and other external factors as well as the conceptual design output. The parameters include both the objective for what a system is expected to do and the threshold, which is the minimum acceptable for the system.

8.1.1 Key Performance Parameters

A KPP is a vital characteristic of the project or facility mission. A KPP is a characteristic, function, requirement, or design basis that, if changed, would have a major impact on the system or facility performance, schedule, cost and/or risk; or, the ability of an interfacing project to meet its mission requirements. A requirement identified as a KPP may be a performance, design, or interface requirement. A KPP could be applicable either to the overall system/facility level as a whole, and/or to one or more major subsystems. Parameters that are appropriate for KPPs are those that express performance in terms of accuracy, capacity, throughput, quantity, processing rates, purity, or others that define how well a system, facility, or other project will perform.

Examples include:

- The Pit Disassembly and Conversion Facility (PDCF) shall be capable of processing 35 metric tons of plutonium metal over 10 years of operation.
- The High-Level Waste (HLW) vitrification system shall be capable of 100 kg per hour of qualified chemical makeup; containing 40 weight percent HLW running on average 2/3 of the time.

- The Tritium Extraction Facility shall be capable of extracting and processing tritium-containing gases from irradiated Tritium Producing Burnable Absorber Rods from a Commercial Light Water Reactor and delivering from 2.5 to 3 kg of tritium per year.
- The Research Office Building shall be capable of housing 300 scientists, engineers, and other support personnel.
- The Business Projection System will provide the capability to handle 1000 users at all times, have a response time of no longer than 7 seconds, and be online 99.9% of the time. However, redundancy need only be available 85% of the time.

The project parameters will evolve as the project definition matures. At the start of the project, during the early planning, definition, and risk reduction stages, performance parameters are usually only measures of effectiveness or measures of performance for a needed capability. More specific project parameters are developed as the requirements become better defined. The majority of the parameters will be defined during concept exploration and design phases. KPPs should be identified which reflect the minimum and/or maximum acceptable performance for the system at completion. The total number of performance parameters can be limited (generally to five or six), and may include parameters that drive effectiveness, schedule, and cost.

8.1.2 Schedule Parameters

Schedule parameters include decision points, major milestones, initial operation, and other critical system events. The mandatory schedule parameters should include all phases of the project, major decision points, deliverables, and initial operation. A project may propose other major events, and they will be included in the APB following approval by the AE. If the threshold values are not otherwise specified, the threshold value for schedule should be the objective value plus six months for MS projects and three months for non-MS projects.

Schedule parameters are established through an interactive process that proceeds integrally with the technical and cost processes. Critical path activities, events, milestones, and resources are developed using a disciplined approach and properly integrated with all other appropriate elements. Schedules are to reflect realistic, risk-adjusted durations and milestone events that mitigate risks identified during risk analysis.

8.1.3 Cost Parameters

The cost parameters contained in the APB should identify the TPC and, in general, include direct costs such as research, development, test, construction, remediation, procurement, fabrication, services and items (equipment, design, etc.), transition and startup operations. Cost of quality, environmental, safety, and occupational health activities, as well as the costs of acquisition items procured with operations and maintenance funds, may be included. Indirect costs not directly attributable to the project but resulting from the project, including any infrastructure costs, are to be included. For reporting purposes, the cost estimate uses life cycle costs and present cost figures in escalated (year of

expenditure) dollars. These costs are identified as either TEC or Other Project Costs (OPC). Operationally funded projects may or may not segregate their costs appropriately in these categories, depending upon program guidance. Escalation rates should be documented, and should be those published. Escalation rates used are documented as part of the APB approval process at CD-2. Multiple KCPs may be developed. **At a minimum KPPs shall be established for TPC and TEC. The TPC is a maximum parameter that cannot be exceeded without being classified as a breach and presented to the SAE for a Decision.** All project estimates having a TPC greater than $5M should segregate their costs by TEC and OPC. Cost estimates should initially reflect realistic and risk adjusted estimates of the TPC, including a careful and thorough assessment of risk. Budgeted amounts should not exceed the total cost objectives in the APB.

The cost parameters are limited to the TPC, TEC, and OPC in budget year dollars, and as with the other APB elements, are documented in the PDS. The APB and TEC should only include costs that are part of the project as approved by the AE.

The threshold values for the TPC are a maximum parameter and are not to be exceeded.

8.2 Acquisition Performance Baseline Preparation, Submission and Approval

The APB is submitted as part of the CD-2 package. The APB should be submitted to the AE for approval and authorization to continue the project. The approach taken is dependent on the project. When a project is not complex and requires little development, the key parameters may not require significant evolution. The essential requirement is to establish an APB that is fully achievable. Establishing the APB earlier than reflected in the models in Appendix C, is generally not advisable. However, if an APB is required sooner, it is done only after careful consideration of the risks. From a historical perspective, establishing an APB earlier has been a key contributor to baseline growth.

The development and documentation of the APB which represents the required capability evolves as the mission need and requirements analysis processes evolve. The preliminary parameters may only be able to define the objective or even the threshold. The APB continues to mature during conceptual design until all issues preventing definition of the APB are resolved and the key parameters necessary for an APB have been determined.

The application of risk adjustments (allowances) should be considered in all APB development as being both prudent and necessary. **The APB shall be risk assessed and adjusted for both durations and costs providing a realistic, achievable APB commitment.** Allowances are derived through an analysis of the work scope being scheduled and estimated. This analysis includes technical, schedule, and cost risks as they apply to the Program/project efforts, and is used to account for the uncertainties existing in each component. The magnitude of estimated allowances (schedule, cost, etc.) depend upon the stage of planning and definition, design, procurement, and construction; and, the complexities and uncertainties of the operation or component parts of the project or Program. Allowances are a balance between the need to timely establish the APB and the

fact that uncertainties can never be completely eliminated until the project is complete. At CD-2, the APB should be established with a high confidence level. When this is done through a deterministically statistical approach (Monte Carlo) it is normally established at a 80 to 85% confidence level. However if the allowances are excessive it is an indication that the APB is not yet sufficiently mature. Extreme care needs to be taken in establishing a premature APB.

During project planning, allowances are often estimated as a percentage of a particular cost, schedule, or category of work. Allowances are estimated at an appropriate level based on a review of each major cost category/activity. A base estimate is generally a "best or nominal effort" to develop expected schedules and costs. Substantial projects with large complexities and many unknowns should utilize appropriate and systematic probability-based risk analysis as discussed in Chapter 9. These projects will normally use a deterministic statistical approach (e.g. Monte Carlo) and simulations to properly develop probability-based risk allowances. These allowances are then incorporated into the APB to generate the desired probability of underrun that forms the bases for the allowances in the estimate.

A short list of recommendations concerning the process for determining and applying risk-adjustments include:

- Ranges are estimated at an activity level or at a summary level. Preferably, ranges are estimated as close to the activity level as possible.
- Allowances consider the varying degrees of risk associated with various activities.
- Allowances are not used to avoid the effort required to prepare a properly detailed and documented cost estimate.
- Schedule and cost allowances may be developed for each project task, with the amount of allowance assigned to the various activities reflecting the importance, cost, and difficulty of the task. These individual allowances are used in developing the project schedule and build the cost estimate.
- A process allowance (or margin) is to be developed and included in project design, especially those having process systems, equipment, valves, lines, and vessels. (This allowance accommodates margins of error in process equipment sizing, and a prudent amount of "surge" in the process systems.)

Once the risk assessments for technical, schedule, and cost have been completed and allowances calculated, these are included in the TPC estimate. These allowances are a key item in supporting the APB at CD-2.

The APB is documented in the PDSs. The APB parameters contained in the PDS should not be changed unless there is a deviation or administrative breach, both of which require approval of the SAE to rebaseline the project (see Section 2.6). The PDS is part of the CD-2 package.

The project record in the PARS is to be created, and when necessary, updated with the most recent APB information. Once the record has been updated, no further changes to the APB values are permitted unless SAE approval is obtained.

In establishing the APB, project completion should be clearly and unambiguously defined. A primary consideration is whether project completion is defined as system or facility turnover to the user, or whether subsequent costs (operating and D&D) are included in the overall performance baseline (life cycle approach). The APB should include a milestone dictionary that clearly and unambiguously defines all milestones, including project completion.

The APB captures all project costs (TPC includes both capital and operating components) even if the project is fully funded by operating appropriations. Thus:

- TPC = TEC + OPC (including all allowances).
- TEC is Total Estimated Cost which represents system, facility design, procurement and construction costs and allowances, regardless of the source or type of funds. The TEC normally consists of the following: cost of land and land rights, engineering, design and inspection costs, direct and indirect construction costs, and initial equipment necessary for the project to be placed in operation.
- OPC is Other Project Costs related to research, engineering, development, startup, and operations. These activities/costs and allowances are essential for project execution, but are not considered part of the normal capital system/facility acquisition cost, and are Operating/Expense (OPEX) funded. The following format should be used as a cover sheet for the APB package.

ACQUISITION PERFORMANCE BASELINE AGREEMENT
_____ PROJECT

With the objective of enhancing project stability and controlling costs, we, the undersigned, submit this baseline document for approval. Our intent is that the project be managed within the performance, schedule and financial constraints identified. We agree to support the full required funding in the budget submission.
This APB summary does not provide detailed project requirements or content. It does, however, contain key performance, schedule, and cost parameters that are the basis for satisfying the identified mission need. The objectives as established in the APB are under change control, and as long as it is being managed within the thresholds established by this baseline, only CD-3 and CD-4 require approval by the AE.

[SIGNED)

_____ _____
_____ DATE_____
Project Manager
[SIGNED]_____ DATE_____
Assistant Secretary

[SIGNED]_____ DATE_____
Deputy Secretary of Energy

cc: OMBE

An example of an APB can be found in the Practice on APB Development and Validation.

8.3 Acquisition Performance Baseline Deviations

A deviation occurs when the PM has reason to believe that the current estimate of a performance, schedule, or cost parameter(s) is/are not or will not support the threshold value(s) for that KPP(s). When a deviation occurs, the PM is to directly and immediately notify the SAE and the AE by memorandum with a copy to the Operations or Area Office Manager, PASs, Under Secretaries, and OMBE (see Section 2.6). Within 30 days of the occurrence of the project deviation, the PM should notify the AE of the reason for the project deviation and the actions that need to be taken to bring the project back within the baseline parameters (if this information was not included in the original notification). Within 90 days of the occurrence of a project deviation, one of the following should have occurred:

- The project is to be back within APB parameters

- A new APB (changing only those parameters that breached and/or are unexecutable) will have been approved by the SAE
- An SAE-level project review will have been conducted with a recommendation on a course of action.

In conducting the review, the ESAAB chairperson will determine whether there is a continuing need for a project that is sufficiently behind schedule, over budget, or not in compliance with performance requirements, and recommend to the SAE suitable actions to be taken, including termination, with respect to such project. Any deviation that results in a breach, that is a result of legislative or executive action, such as an appropriation act that modifies the funding or otherwise makes a constructive change in the project, should be deemed an administrative deviation. Any and all such changes should be documented and administratively approved (no ESAAB or ESAAB-equivalent required) by the appropriate SAE/AE within 90 days of the time of the event precipitating the action (see Section 2.6). Subsequent to the action, any approved change in the APB will be updated in PARS, and during the next budget cycle the PDS. Administrative deviations will not be statistically recorded as deviations; however, parameter changes should be reflected in updates. The deviation report summarizes and provides limited analysis of the issue(s) in a one-page format, as depicted.

PROJECT DEVIATION REPORT FORMAT

Memorandum for Deputy Secretary of Energy
FROM: DOE Project Manager
SUBJECT: Project _____ Deviation Report

The _____ Project has deviated from its currently approved APB, dated _____. This deviation is described as follows:

Analysis: The IPT and I have prepared and attached a proposed change to the current APB. We request your review and action on the proposed APB as attached.

cc: OMBE
OECM
Program Support Project Offices
Under Secretary and/or NNSA Administrator